REMARKS

Applicants respond hereby to the outstanding Office Action mailed November 28, 2007 in this application. Claims 8, 9, 11, 12, 14, 15 and 17-22 are pending, where claims 8, 11 and 14 are the independent claims.

In the outstanding Office Action, the Examiner rejects independent claims 8, 11 and 14 under 35 U.S.C. 102 (a) as anticipated by U.S. Patent 6,044,361 to Kalagnanam, et al. (Kalagnanam). Claims 17-19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kalagnanam. Claims 9, 12, 15, 20 and 21 were rejected under 35 U.S.C. 103(a) as unpatentable over Kalagnanam, and further in view of U.S. Patent 4,459,663 Dye (Dye). And claims 8, 11, 14 and 17-19 were rejected under 35 U.S.C. 103(a) as being unpatentable over a disclosure provided in a document entitled "Production Planning and Scheduling" (ACESITA).

Response To Rejections Under 35 USC §102(b)

To support the rejection of independent claims 8, 11 and 14, the Examiner asserts that Kalagnanam discloses:

A computer implemented method for allocating finished units in a production facility to orders received from customers for those units, the computer implemented method comprising the steps:

identifying orders from customers for finished units;

identifying finished units in production at a defined time and available to fill said orders;

identifying defects in the finished units and defects that the customers are willing to accept **[col. 2, lines 27-33, 58-68]**;

of said identified finished units, identifying valid units that are available **to be assigned** to said orders **[Abstract]**;

for each of the finished units, creating an associated surface defect map indicating the locations of defects in said each finished unit and characteristics of said defects **[Summary]**;

using said defect maps to search for the largest area in each of the finished units that can be assigned to each order **[Fig. 4 search tree]**;

iteratively assigning and unassigning valid units to said orders, in a defined sequence of said orders, until either (i) all the orders are fulfilled, or (ii) there are no more assignment options to be tested, including

identifying any incomplete orders, and for each identified incomplete order, searching among valid units previously assigned to other orders for a unit that fulfills said identified incomplete order **[cols. 4-6]**, and

if a unit, previously assigned to some other order, is found that fulfills said identified incomplete order, then (i) unassigning said found unit from said other order and (2) re-assigning said found unit to said identified incomplete order.

In response, applicants respectfully assert that these claims patentably distinguish over Kalagnanam because Kalagnanam not disclose or suggest identifying defects that customers can accept, creating a defect map for finished units, or the use of such a surface defect map in the process of assigning finished units to orders. These limitations are included in each of independent claims 8,

11 and 14.

Broadly, the invention as claimed relates to allocating materials in a production facility to customer orders. The invention takes into account defects on the surface of a piece of material, and the customer requirements. In particular, for each of the finished units, an associated surface defect map is created to indicate the location of defects in those finished units, and characteristics of those defects. These defect maps are then used to search for the largest area in each of the finished units that can be assigned to each order. The invention lists all incomplete orders by due dates, processes the list and assigns incomplete orders to available areas of the coils (pieces of material). If no available area is found, the algorithm identifies which is the smallest order that can be unassigned in order to open space for the incomplete order. The algorithm continues doing this until all orders are completed, or no more options of reallocation are found.

Kalagnanam, as distinguished, discloses a computer-implemented inventory matching method based on multiple assignments per iteration. This method has four major steps. In the first step, a feasible solution is created by applying an iterative bipartite matching algorithm on a given initial solution. The second step involves improving the solution by solving a max flow problem; and in the third step, a multi-key sort is used to identify undesirable matches in a given feasible solution. The fourth step is to backlift the solution by removing the undesirable matches from the feasible solution. Kalagnanam identifies multiple solutions, where the invention as claimed processes the customer orders using the defect maps to identify one solution.

Independent claims 8 and 14 describe the steps of, for each of the finished units, creating an associated surface defect map indicating the locations of defects in said each finished unit and characteristics of said defects, and using these defect maps to search for the largest area in each of the finished units that can be assigned to each order. Independent claim 11 is directed to a system for allocating finished units to orders received from customers for those units, and calls out means for creating, for each of the finished units, an associated surface defect map indicting the locations of defects in said each finished unit and characteristics of said defects, and means for using those defect maps to search for the larges area in each of the finished units that can be assigned to each order.

While the Examiner asserts that Kalagnanam discloses identifying orders from customers for finished units, identifying finished units in production at a defined time and available to fill said orders; and identifying defects in the finished units and defects that the customers are willing to accept at **col. 2, lines 27-33, 58-68**, applicants respectfully disagree. The cited text at lines 27-33 states that each slab associated with an inventory comprises two sets of attributes, the first set pertaining to exact quality requirements, and the second set pertaining to slab width, thickness and weight. The cited text at lines 58-68 states that two sets of constraints are used as assignment restrictions, the first being that only slabs of a higher quality apply, and how these the slabs are listed in an order. Nowhere in the cited text does Kalagnanam disclose identifying orders from customers for finished units, identifying finished units in production at a defined time and available to fill said orders and identifying defects in the finished units and defects that the customers are willing to accept. Applicants urge the Examiner to see that the subject matter as a whole of independent claims 8, 11 and 14 is patentably distinct from the subject matter disclosed by Kalagnanam.

While the Examiner asserts that Kalagnanam discloses, for each of the finished units, creating an associated surface defect map indicating the locations of defects in said each finished unit, and characteristics of said defects in the **Summary**, applicants again respectfully disagree. Kalagnanam's Summary describes the computer implemented inventory matching method as quickly creating near-optimal solutions that are non-dominated solutions. The Summary further states that unlike traditional branch-and-bound techniques or their equivalents, the Kalagnanam method uses iterative bipartite matching algorithms with repetitive multiple assignments and unassignments, a max flow formulation to exploit the flexibility in a MU.sub.size definition, to improve the quality of the solutions and multi-key sorting, which identifies undesirable matches and for backlifting solutions. Kalagnanam is not found to disclose, for each of the finished units, creating an associated surface defect map indicating the locations of defects in said each finished unit and characteristics of said defects. The use of the claimed defect map is essential to the claimed subject matter.

While the Examiner asserts that Kalagnanam discloses, using said defect maps to search for the largest area in each of the finished units that can be assigned to each order, in the **Fig. 4 search tree,** applicants again disagree. Kalagnanam's Fig. 4 is not a defect map, but a search tree included to illustrate Kalagnanam's multi-assignment based backjumping algorithm. Kalagnanam's Fig. 4 search tree is not equivalent to applicants' defect map used to search for the largest area in each of finished units that can be assigned to an order as claimed.

While the Examiner asserts that Kalagnanam discloses, iteratively assigning and unassigning

valid units to said orders, in a defined sequence of said orders, until either (i) all the orders are fulfilled, or (ii) there are no more assignment options to be tested, including identifying any incomplete orders, and for each identified incomplete order, searching among valid units previously assigned to other orders for a unit that fulfills said identified incomplete order, at **cols. 4-6**, applicants again respectfully disagree. Applicants have carefully analyzed Kalagnanam's columns 4-6, and do not find the steps of:

iteratively assigning and unassigning valid units to said orders, in a defined sequence of said orders, until either (i) all the orders are fulfilled, or (ii) there are no more assignment options to be tested, including

identifying any incomplete orders, and for each identified incomplete order, searching among valid units previously assigned to other orders for a unit that fulfills said identified incomplete order, when taken in the context of the subject matter of the claims as a whole.

Applicants respectfully assert, therefore, that Kalagnanam does not show each of the elements of independent claims 8, 11 and 14, and, therefore, does not anticipate these claims under 35 USC §102(e). Applicants respectfully request withdrawal of the rejection of claims 8, 11 and 14 in view of Kalagnanam thereunder.

Response To Rejections Under 35 USC §103

Kalagnanam

Claims 17-19 and 22 were rejected under 35 USC §103(a) as unpatentable over Kalagnanam. To support the rejection, the Examiner asserts that Kalagnanam shows that the finished units are

metallic, does not show identifying for each of a group of orders the largest area of each of the units that can be assigned to the order, but that it would have been obvious to one skilled in the art at the time of the invention to modify Kalagnanam so that it identifies the largest area of metallic units that can be assigned to the orders to reduce cost and waste.

Applicants respectfully disagree that it would have been obvious to the skilled artisan at the time of the invention to modify Kalagnanam to identify the largest area of metallic units that can be assigned to the orders to reduce cost and waste. While both Kalagnanam and claims 17-19 and 22 may both have the purpose in mind to identify the largest area of metallic units that can be assigned to the orders to reduce cost and waste, the different inventions approach the broad problem from different perspectives, and implement different constructions and processes, e.g., the claimed creation and use of the defect map to find a single solution.

Moreover, claims 17-19 depend from claim 8, 11 and 14, respectively, and claim 22 depends from claim 8. Independent claims 8, 11 and 14 were distinguished from Kalagnanam above under section 102(e). Hence, even combined with identifying for each group of orders the largest area of each of the units that can be assigned to an order does not overcome the differences pointed out in applicants' section 102(e) arguments. Claims 17-19 and 22, therefore, are not obvious in view of Kalagnanam under section 103(a) for at least the reasons stated, and applicants respectfully request withdrawal of the rejection of claims 17-19 and 22, thereunder.

Dye

Claims 9, 12, 15, 20 and 21 were rejected under 35 USC §103(a) as unpatentable over

Kalagnanam in view of Dye. To support the rejection, the Examiner asserts that Kalagnanam shows all the elements of the claims but for identifying incomplete orders and due data, and assigning units to the earliest orders. The Examiner concludes that it would have been obvious to modify Kalagnanam by identifying the date of orders and assigning items to the earliest order to avoid missing a delivery date.

Dye relates to allocating quantity of materials to manufacturing orders in a discrete manufacturing production line, without simulating the different manufacturing options that material could be submitted in order to be manufactured. The present invention as claimed goes further and is concerned with the geometrical constraints of the defects and of the order requirements, not discrete manufacturing.

Applicants respectfully disagree that it would have been obvious to the skilled artisan would at the time of the invention to modify Kalagnanam by the teachings of Dye to identify incomplete orders and due dates, and assigning units to the earliest orders to avoid missing a delivery date. While both Dye and claims 9, 12, 15, 20 and 21 may both have the purpose in mind to identify incomplete orders and due dates, and assigning units to the earliest orders to avoid missing a delivery date, the different inventions approach the broad problem from different perspectives, and implement different constructions and processes, e.g., the claimed creation and use of the defect map to find a single solution.

Moreover, claims 9, 12 and 15 depend from claim 8, 11 and 14, respectively, and claims 20

and 21 depend from claim 8. Independent claims 8, 11 and 14 were distinguished from Kalagnanam above under section 102(e). Hence, even combined with Dye, the combination does not overcome the differences between the independent claims and Kalagnanam that were pointed out in applicants' section 102(e) arguments. Claims 9, 12, 15, 20 and 21, therefore, are not obvious by Kalagnanam combined with Dye under section 103(a) for at least the reasons stated, and applicants respectfully request withdrawal of the rejection of claims 9, 12, 15, 20 and 21, thereunder.

ACESITA

Claims 8, 11, 14 and 17-19 were rejected under 35 USC §103(a) as unpatentable over ACESITA. To support the rejection, the Examiner asserts that ACESITA shows:

identifying finished units and orders for finished units;

identifying orders from customers for finished units;

identifying finished units in production at a defined time and available to fill said orders;

identifying defects in the finished units and defects that the customers are willing to accept;

of said identified finished units, identifying valid units that are available to be assigned to said orders;

and units to orders **[page 22, 42]**;

for each of the finished units, creating an associated surface defect map indicating the locations of defects in said each finished unit and characteristics of said defects;

using said defect maps to search for the largest area in each of the finished units that

can be assigned to each order.

The Examiner does not refer to any place in ACESITA but for pages 22 and 42, to support that ACESITA discloses each of the aforementioned claim elements. The Examiner continues by stating that ACESITA does not disclose iteratively assigning and unassigning valid units to said orders, in a defined sequence of said orders, until either (i) all the orders are fulfilled, or (ii) there are no more assignment options to be tested, including, if a unit, previously assigned to some other order, is found that fulfills said identified incomplete order, then (i) unassigning said found unit from said other order and (2) re-assigning said found unit to said identified incomplete order. The Examiner concludes that based on official notice, the skilled artisan would know to modify ACESITA to realize the invention as claimed by iteratively assigning and unassigning units to orders, and wherein if no units are available to fulfill an order, finding a previously assigned valid unit in another order, and unassigning it from the other order (to which it was assigned) in order to ensure that all possible options are tested so the most efficient option can be used.

Applicants respectfully disagree. ACESITA describes preliminary ideas of the present invention. An important feature of the ACESITA system is the capacity of considering the current conditions of a piece of material and verifying what further manufacturing steps are necessary to transform that material so that it will fit an order. ACESITA does not disclose creating a defect map, and using the defect mapped as claimed. While ACESITA does have minimizing waste as its intended purpose, when compared to applicants' invention as claimed does so in a significantly different way, using significantly different elements.

In more detail, while the Examiner asserts that ACESITA discloses identifying finished units and orders for finished units, identifying orders from customers for finished units, identifying finished units in production at a defined time and available to fill said orders, identifying defects in the finished units and defects that the customers are willing to accept, of said identified finished units, identifying valid units that are available to be assigned to said orders, at **page 22, 42,** applicants respectfully disagree.

ACESITA at page 22 describes technical specifications and routing of orders, their inventory application broadly, and some characteristics of the proposed functional architecture. ACESITA at page 42 describes their inventory application process as matching relevant attributes of available material to the specification of the orders and determines eligibility of the material for a given order. ACESITA does not show, for each of the finished units, creating an associated surface defect map indicating the locations of defects in said each finished unit and characteristics of said defects; using said defect maps to search for the largest area in each of the finished units that can be assigned to each order. That is, ACESITA does not disclose the use of a defect map as claimed. Nor does ACESITA disclose allocation and reallocation of orders to precise regions of coils (materials) so that the minimum quality of an order is not violated while minimizing waste of material.

In view of these differences between claims 8, 11, 14 and 17-19, and the ACESITA, and because of the advantages associated with those differences, claims 8, 11, 14 and 17-19 patentably distinguish over the ACESITA and are allowable under section 103(a). The Examiner is accordingly, respectfully asked to reconsider and to withdraw the rejections of claims 8, 11, 14 and

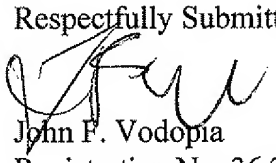
17-19 under 35 U.S.C. 103(a), and to allow those claims.

Conclusion

For the reasons advanced above, the Examiner is respectfully requested to reconsider and to withdraw the rejections of claims 8, 11 and 14 under 35 U.S.C. 102 (a) as anticipated by Kalagnanam, the rejection of claims 17-19 under 35 U.S.C. 103(a) over Kalagnanam, the rejection of claims 9, 12, 15, 20 and 21 under 35 U.S.C. 103(a) over Kalagnanam in view of Dye and claims 8, 11, 14 and 17-19 under 35 U.S.C. 103(a) over ACESITA.

If the Examiner believes that a telephone conference with Applicants' Attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully Submitted,



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